



**UNIVERSITY
OF LONDON**

Programme Specification 2021–2022

Data Science and Artificial Intelligence

MSc
PGDip
Individual modules

Important document – please read

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Important information regarding the Programme Specification

About this document

Last revised: 26 May 2021

The Programme Specification gives a broad outline of the structure and content of the programme, the entry level qualifications, as well as the learning outcomes students will achieve as they progress. Some of the information referred to in this programme specification is included in more detail on the University of London website. Where this is the case, links to the relevant webpage are included.

Where links to external organisations are provided, the University of London is not responsible for their content and does not recommend nor necessarily agree with opinions expressed and services provided at those sites.

If you have a query about any of the programme information provided, whether here or on the website, registered students should use the *Ask a question* button in the [Student Portal](#). Otherwise, the *Contact Us* button at the bottom corner of every webpage should be used.

For the Data Science and Artificial Technology programme, you should note the following terminology:

Preparatory course: a non-credit bearing, non-assessed optional short course available to students to ensure readiness to start core and compulsory modules.

Module: Individual units of a programme are called modules. Each unit is a self-contained, formally structured learning experience with a coherent and explicit set of learning outcomes and assessment criteria.

Core module: Core modules are central to the teaching and learning on the programme and often introduce concepts and ideas that appear in the optional modules. Core modules must be passed and cannot be compensated.

Compulsory module: Compulsory modules introduce concepts and ideas that appear in optional modules. Students must take these modules as part of their studies. They are subject to the rules for compensation.

Optional module: Optional modules are designed to extend the concepts and ideas introduced in core and compulsory modules and to introduce other relevant concepts and techniques. Students may select their optional modules from a list. They are subject to the rules for compensation.

Key revisions made

Programme specifications are revised annually. The quality committee of Goldsmiths, University of London, as part of its annual review of standards, confirms the programme structure and the educational aims and learning outcomes, and advises on any development in student support.

Significant changes made to the programme specification 2021-2022

The programme team has introduced an optional preparatory short course to ensure all students have the necessary basic programming skills to confidently embark on the course confidently.

Alternative Assessments during the Coronavirus (COVID-19) Outbreak

In line with our current General Regulations, the University may offer you alternative assessments where necessary. This includes holding online timed assessments in place of written examinations, which are usually held at examination centres. Please note that this statement replaces any published information relating to assessments or written examinations in any of our materials including the website. Previously published materials relating to examinations should therefore be read in conjunction with this statement.

Programme title and awards

Postgraduate Degrees of the University of London may be classified. Your award certificate will indicate the level of the academic performance you achieved by classifying your award. The classification of your degree will be based on the marks from the assessed work you complete.

The classification system for the MSc, Postgraduate Diploma and Postgraduate Certificate in Data Science and Artificial Intelligence is as follows:

Distinction; Merit; Pass.

Specific rules for the classification of awards are given in the [Programme Regulations](#), under Scheme of Award.

Programme title

Data Science and Artificial Intelligence

Qualifications

- Master of Science in Data Science and Artificial Intelligence
- Postgraduate Diploma in Data Science and Artificial Intelligence
- Postgraduate Certificate in Data Science (exit qualification only)

Intermediate qualifications

The intermediate qualification for this programme is the Postgraduate Diploma as listed above.

Students may be awarded an intermediate qualification (i.e. a related diploma) as they progress through the MSc or Postgraduate Diploma if they complete the requirements for that award. The student may apply for the intermediate qualification whether or not they are registered on it. The specific rules are given in the [Programme Regulations](#) under Section 1.

Exit qualifications

Students who for academic or personal reasons are unable to complete their MSc may exit the programme with the successful completion of 120 or 60 credits and be awarded a Postgraduate Diploma or Postgraduate Certificate respectively. All Postgraduate Certificates will be awarded in Data Science only. Postgraduate Diplomas will be awarded in line with the student's registered programme of study. Exit qualifications are awarded at the discretion of the Board of Examiners. Once a student has accepted an exit qualification they will not be permitted to continue their study towards a higher award on the programme.

Individual modules

There is also provision for individual modules to be studied on a stand-alone basis.

Information on the maximum number of credits permitted on a stand-alone basis is given in the [Programme Regulations](#).

Qualification titles may be abbreviated as follows:

Master of Science – MSc

Postgraduate Diploma – PGDip

Postgraduate Certificate – PGCert

Level of the programmes

The Framework for Higher Education Qualifications in England, Wales and Northern Ireland (FHEQ) forms part of the UK Quality Code for Higher Education of the [Quality Assurance Agency for Higher Education](#) (QAA).

The awards are placed at the following Levels of the Framework for Higher Education Qualifications (FHEQ):

- MSc – Level 7
- PGDip – Level 7
- PGCert – Level 7 (exit qualification)

Awarding body

University of London

Registering body

University of London

Academic direction

Goldsmiths, University of London

Accreditation by professional or statutory body

Not applicable

Language of study and assessment

English

Mode of study

Web supported learning with an online tutor or institution supported learning from a local institution, where this is available.

The [website](#) provides further information about the University's Recognised Teaching Centres.

Maximum and minimum periods of registration

The MSc can be completed in one year, or students can take up to five years. This flexibility allows students to study at their own pace (either part-time or full-time), adjusting the intensity of their study to suit their needs. The minimum and maximum periods of registration for the programme are set out below:

Programme Specification 2021-2022 Data Science and Artificial Intelligence (MSc/PGDip)

	Minimum	Maximum
MSc	One year*	Five years
PGDip	One year*	Five years
Individual Modules	One year*	Two years

*Subject to module availability

Programme structures

The programmes will have two registration points in the year corresponding with start dates for modules.

Students have an online induction session available through the Virtual Learning Environment (VLE) prior to the start of their initial study session, which will include orientation of their learning environment and guidance on the structure and learning expectations of the programme.

The **MSc Data Science and Artificial Intelligence** is a 180 UK credit degree programme (90 ECTS credits). For the MSc, a student must complete:

- four core modules (60 credits total)
- three compulsory modules (45 credits total)
- three optional modules (45 credits total)
- a Final Project (30 credits total)

The **PGDip Data Science and Artificial Intelligence** is a 120 credit programme (60 ECTS credits). For the PGDip, a student must complete:

- four core modules chosen (60 credits total)
- three compulsory modules (45 credits total)
- one optional modules (15 credits total)

The **PGCert Data Science** (exit qualification only) is a 60 credit programme (30 ECTS credits). For the PGCert, a student must complete:

- any two core modules (30 credits total)
- any two other modules (either further core or optional modules) (30 credits total)

Credit value of modules

Further information about the credit systems used by universities in the UK and Europe is provided by the [Quality Assurance Agency](#) and the [European Credit Transfer and Accumulation System](#).

Where credits are assigned to modules of a programme, credit indicates the amount of learning carried out in terms of the notional number of study hours needed, and the specified

[Framework for Higher Education Qualifications in England](#) (FHEQ) credit level indicates the depth, complexity and intellectual demand of learning involved. The details below indicate the UK credits and the European Credit Transfer and Accumulation System (ECTS) values.

For the Data Science programmes, modules have the following credit values:

- core, compulsory, and optional modules are each worth 15 UK credits or 7.5 ECTS credits
- the final project is worth 30 UK credits or 15 ECTS credits

One UK credit equates to a notional ten hours of study.

Recognition of prior learning

Recognition of prior learning is a generic term for the process by which we recognise and, where appropriate, award credit for learning that has taken place at an institution other than the University of London. Where the prior learning covered a similar syllabus to a module/course on the University of London programme, credit will be awarded as if you had taken the University of London module/course.

See the [General Regulations](#) (Section 3) and the [Programme Regulations](#) for more rules relating to prior learning.

For this programme, the University of London may recognise your prior learning and award you credit towards the qualification up to the value of 120 UK credits for the MSc, 60 UK credits for the PGDip and 30 UK credits for the PGCert. Recognition of prior learning will not be considered for the Final Project.

Entrance requirements

Applicants must submit an application in line with the procedures and deadlines set out on the [website](#).

Entry Route 1

To be eligible to register for any of the Data Science programmes, you must have the following:

- A bachelor's degree (or an acceptable equivalent) in a relevant subject which is considered at least comparable to a UK second class honours degree, from an institution acceptable to the University.
- Previous degrees should normally include a sufficient level of programming such as Python detailed in your transcript. Whilst other degrees such as Engineering and Mathematics will be considered on a case by case basis.

If we consider your previous degree as non-relevant then we will request you take our MOOC, [Foundations of Data Science: K-means Clustering in Python](#), before you start our Data Science programme. This MOOC requires approximately 30 hours of study.

Entry Route 2

If applicants do not meet the academic requirements for entry route 1, they can apply for the programme via entry route 2.

To be eligible to register, applicants must have the following:

- A bachelor's degree (or an acceptable equivalent) in any subject which is considered at least comparable to a UK second class honours degree, from an institution acceptable to the University.

In addition to the above, you will be required to complete an online preparatory course prior to registration. The online preparatory course, [Foundations of Data Science: K-Means Clustering in Python](#), requires approximately 30 hours of study.

Full details of entrance requirements are given on the [programme page](#), under the Entrance requirements tab.

English language requirements for the Data Science programmes

Applicants will meet the English language requirement if they have passed any of the following within the past three years:

- (IELTS) International English Language Testing System - an overall score of 6.5 or above with a minimum of 6.0 in the written test
- Pearson Test of English (Academic) – an overall score of 59 or above, with at least 59 in both the reading and writing tests and at least 54 in the speaking and listening tests
- Cambridge English: Proficiency qualification
- Cambridge Certificate of Advanced English - grade C or above; *or*,
- (TOEFL) iBT Test of English as a Foreign Language – an overall score of 92 or above, with at least 22 in both the reading and writing skills tests and at least 20 in both the speaking and listening tests.

Alternatively, an applicant may satisfy the English language requirements for an MSc, PGDip if they have:

- Substantial education (minimum of eighteen months) conducted and assessed in English *or*
- Substantial work experience (minimum of eighteen months) conducted in English.

Where an applicant does not meet the prescribed English language proficiency requirements but believes that they can demonstrate the requisite proficiency for admission the University may, at its discretion, consider the application.

Computer specification and internet access

All students must have regular access to a computer (or mobile device*) with an internet connection to use the University of London website and the Student Portal. These are where the programme's study resources are located. Through the Student Portal, students can register, enter exams and use the programme's Virtual Learning Environment (VLE). The VLE provides electronic learning materials, access to the University of London Online Library, networking opportunities, and other resources. A webcam may be required in the event that online timed assessments (if offered) are proctored, and in such a case, it is a student's responsibility to ensure that they have a webcam.

For students to get the most from their studies, their computers should have at least the following minimum specification:

- a web browser (the latest version of Firefox, Chrome or Internet Explorer are recommended). This must accept cookies and have JavaScript enabled
- screen resolution of 1024 x 768 or greater
- sufficient bandwidth to access and upload video content
- the ability to play videos including sound and speakers.

And the following applications installed:

- a word processor that accepts Microsoft Word formats (.doc and .docx)
- a PDF reader (e.g. Adobe).

Certain courses may have additional requirements, such as:

- video and audio recording capability, such as via web cam or other device
- microphone
- the ability to install software on the computer, noting that in the institution supported model the institution should install all necessary software on lab machines where appropriate
- installation of a programmer's text editor such as Atom and integrated development environment software (IDE) where necessary.

Students with specific access requirements

The University of London welcomes applications from disabled students and/or those who have access requirements. The University will make every effort to provide reasonable adjustments to enable those with a disability, learning difficulty or access requirements to have the same opportunity as all other students to successfully complete their studies.

The University is committed to managing the application procedure and the programme itself to ensure that services are accessible for all students and that an inclusive environment is created. Students with a disability, or others who may need access arrangements to assist in taking examinations, should complete the relevant section of the application form, or contact the [Inclusive Practice Manager](#). A separate room or other arrangements may be considered.

Requests are considered by a University panel, whose purpose is to ensure that students with disabilities and/or specific access requirements are neither advantaged nor disadvantaged by such arrangements when compared with other students. These considerations remain separate from the academic selection processes.

For further information, see [Inclusive Practice Policy](#)

Sources of funding and scholarships

Information about potential sources of funding and scholarships is updated annually and where available is included in the prospectus web pages.

For further information see the [website](#)

Educational aims and learning outcomes of the programmes

Programme aims

These innovative online programmes aim to provide students with support through virtual and local learning environments, and the flexibility to study at any time and from anywhere around the globe. They will also provide students with the technical and practical skills to analyse the data that is key to success in future business, digital media and science.

Students will gain:

- a firm grounding in the theory of data mining, statistics and machine learning
- hands-on experience of real world applications, such as social media, biomedical data and financial data and;
- the opportunity to work with industry standard software tools.

MSc Learning Outcomes

A: Knowledge, Understanding and Cognitive Skills

A student who successfully completes the **MSc Data Science and Artificial Intelligence** is expected to be able to:

1. Explain and critically assess a range of artificial intelligence techniques used in data analytics and in other related areas.
2. Critically evaluate emerging data analysis technologies and assess how it can be applied to different types and amounts of data.
3. Analyse in depth how artificial intelligence techniques can be applied to a range of interdisciplinary research areas.
4. Compare and contrast practical and theoretical contexts in which data scientists work.

B: Practical, Professional and Key Skills

A student who successfully completes the **MSc Data Science and Artificial Intelligence** is expected to be able to:

1. Critically analyse the application of technology to a range of real world problems particularly in industry and interdisciplinary research.
2. Apply advanced skills and research-led specialist knowledge in the areas of artificial intelligence to the design of software and data analyses.
3. Demonstrate a deep understanding of cutting edge technologies in the creation of a substantial commercially and/or research-wise relevant project.
4. Propose, plan, execute and evaluate a significant piece of original work.
5. Design and program complex computer software and data products.

6. Use academic writing and presentation skills to write and present about data science topics.

PGDip Learning Outcomes

A: Knowledge, Understanding and Cognitive Skills

A student who successfully completes the **PGDip Data Science and Artificial Intelligence** is expected to be able to:

1. Explain and critically assess a range of artificial intelligence techniques used in data analytics and in other related areas.
2. Critically evaluate emerging data analysis technologies and assess how it can be applied to different types and amounts of data.
3. Analyse in depth how artificial intelligence techniques can be applied to a range of interdisciplinary research areas.
4. Compare and contrast practical and theoretical contexts in which data scientists work.

B: Practical, Professional and Key Skills

A student who successfully completes the **PGDip Data Science and Artificial Intelligence** is expected to be able to:

1. Critically analyse the application of technology to a range of real world problems particularly in industry and interdisciplinary research.
2. Apply advanced skills and research-led specialist knowledge in the areas of artificial intelligence to the design of software and data analyses.
3. Apply an understanding of cutting edge technologies in the creation of a substantial commercially and/or research-wise relevant project.
4. Design and program sufficiently complex computer software and data products.

PGCert Learning Outcomes

A: Knowledge, Understanding and Cognitive Skills

A student who successfully completes the **PGCert Data Science and Artificial Intelligence** is expected to be able to:

1. Explain and critically assess a range of machine learning and statistical data mining techniques used in data analytics and in other related areas.
2. Critically evaluate emerging data analysis technologies and assess how it can be applied to different types and amounts of data.
3. Compare and critically contrast practical and theoretical contexts in which data scientists work.

B: Practical, Professional and Key Skills

A student who successfully completes the **PGCert Data Science and Artificial Intelligence** is expected to be able to:

1. Critically analyse the application of technology to a range of real world problems particularly in industry and interdisciplinary research.
2. Apply advanced skills and research-led specialist knowledge in the areas of machine learning and statistics to the design of software and data analyses.
3. Design and program sufficiently complex computer software and data products.

Learning, teaching and assessment strategies

The core principles of the learning, teaching and assessment strategy for these programmes are outlined below.

Principle 1: Ensuring students are prepared for study

Students will be provided with opportunities to sample the learning content of the Data Science programmes. An online induction will ensure that they are prepared for study and are familiar with the learning environment and sources of support during their student journey.

Principle 2: An engaging and vibrant learning environment

All students will have access to an online learning environment with learning support and tools enabling them to monitor their progress, assessing fulfilment of learning outcomes and development of skills-based outcomes throughout the curriculum. The learning environment will provide a framework for the level of support selected by students, which involves local and online tuition services.

Principle 3: Learning content

The learning content will be designed to provide students with opportunities to engage, and encourage reflective and deep learning, with accessibility a key feature to enable students to study across a range of mobile and media channels.

Principle 4: Student support

All students will have access to the learning environment, learning content, tools and activities related to their chosen programme of study. Students will be able to select from two modes of study: web supported learning or institution supported learning.

Principle 5: Flexibility

To facilitate the requirements of a diverse global community of learners a core feature of this programme is flexibility in the design of the curriculum, providing for pathways to sub-degree and full degree awards and facilitating student progress at a pace suitable to their circumstance.

Principle 6: Assessment

A core feature of these programmes will be a varied range of learning activities embedded within the learning content for each module, designed to provide feedback to students on their progress towards learning outcomes. Summative assessment methods will be designed to promote retention of knowledge, providing encouragement through tutor feedback, with as

wide a range of methods as possible to most effectively assess learning outcomes, within the context of the need for secure and reliable techniques appropriate to flexible learning.

Principle 7: Staff Development

The design, development and delivery of these programmes will be supported with training for:

- Academic teams involved in the development of the materials and assessment;
- Module Leaders;
- Tutors and Administrators at teaching institutions.

Assessment methods

In line with our current General Regulations, the University may offer students alternative assessments where necessary. This includes holding online timed assessments in place of written examinations, which are usually held at examination centres.

For all programmes, each core and optional module (apart from the final project) is summatively assessed by courseworks elements that make up a total of 100% or a combination of coursework and a written examination element that make up a total of 100%. The coursework elements consist of one or more writing assignments and/or one or more programming assignments. The written examination is two hours in length; some examinations are unseen while others allow for some aspect of the examination to be disclosed in advance.

The final project is summatively assessed by a series of coursework submissions and an unseen, final exam. Coursework accounts for 70% of the final mark and the written examination for 30% of the final mark. The coursework submission constitutes multiple, staged deliverables including, but not limited to: a project proposal, a preliminary report, weekly progress logs, a final report and a presentation. The project assessment and the feedback received by the student, is designed to encourage consistent, well-structured activity and progress throughout the project. The written examination is two hours in length and consists of general questions about academic best practice, as well as specific questions about the candidate's own project work.

Students are required to pass each element of the assessment subject to the application of the rules for marginal compensation, where permitted. Refer to the [Programme Regulations](#).

Written examinations take place in September and March.

Examinations are held at [Examination centres](#) throughout the world.

Coursework must be submitted in the VLE by prescribed deadlines.

Student support and guidance

Key features of the support for students include:

- Student induction resources;

- VLE containing: self-assessment and student planner tools; comprehensive learning materials; e-resources/e-library; student forums and progress monitoring tools;
- Local institution tutor (for institution supported learners);
- Online student relationship manager and online tutor (for web supported learners).

Quality evaluation and enhancement

The University of London delivers the majority of its flexible and distance learning programmes through a collaboration between the University of London Worldwide and member institutions of the University of London. However, some of the flexible and distance learning programmes draw solely on academic input from the University of London, and are delivered without academic lead by a member institution. The policies, partnerships (where applicable) and quality assurance mechanisms applicable for the programmes are defined in the following key documents: The Quality Framework, the [Quality Assurance Schedules, Guidelines for Examinations, General Regulations](#) and, for each programme, [programme specific regulations](#).

Awards standards

All University of London awards have to align with the [Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies](#) to assure appropriate awards standards. In addition, every programme that is developed by a member institution of the University of London (or a consortium with representation by more than one member institution) will be developed to the same standard as would be applied within the institution concerned. Proportionate and robust approval procedures, including external scrutiny and student engagement are in place for all programmes. Learning materials are written and all assessments are set and marked by academic staff who are required to apply the University's academic standards.

Review and evaluation mechanisms

The key mechanisms in place to assure the standards of all University of London awards and the quality of the student experience, include:

- Annual programme reports: produced for all programmes in order to review and enhance the provision and to plan ahead;
- Independent external examiners: submit reports every year to confirm that a programme has been assessed properly and meets the appropriate academic standards;
- Annual student information statistics: prepared for all systematic reporting within the University of London;
- Periodic programme reviews: carried out every 4-6 years to review how a programme has developed over time and to make sure that it remains current and up-to-date.

Improvements are made as necessary to ensure that systems remain effective and rigorous.

Student feedback and engagement

The principal channel for collecting feedback from students is the Student Experience Survey. Carried out every two years, it collects feedback from the student body on a range of topics relating to the student lifecycle. The results are analysed externally and then considered in a number of different ways, including by the programme team, principal

committees and the senior leadership team. Details of any resulting actions taken are published on the Virtual Learning Environment and the Student Portal.

Additionally, on completion of their programme of study, students will be invited to take a survey that seeks to measure what they have gained from their studies.

There are also opportunities for students to get involved in governance. An undergraduate and postgraduate student member is appointed by the University to the majority of committees through an annual appointment round. Some programmes also recruit student members at the programme level. Students are frequently invited to take part in quality review processes such as Periodic Programme Reviews, Programme approval, Thematic Reviews, MOOC review panels and ad hoc focus groups. Opportunities such as these are advertised through social media and on the website. More information can be found on the [website](#).

Students can also apply to join the Student Voice Group, which meets four times a year to consider initiatives for enhancing student experience. Notes from these meetings are published on the Student Portal.

After graduation

Further study

Successful completion of the programme may serve as preparation for students who wish to go on to take further study in the subject area. Enquiries about further study opportunities should be directed to the University of London Student Advice Centre.

Employment routes

At registration, students are asked to complete a small number of questions relating to where they are in their career planning. This data is used to assist with the implementation of employability strategies and interventions.

The MSc Data Science and Artificial Intelligence programme develops analytical and practical skills, providing graduates with the tools and competencies of intelligent data analysis for decision making and problem solving, and communication of the results of their investigations, and their implications, to stakeholders or other interested parties. These skills lead naturally to embarking on a variety of careers, with employers from leading technology firms, robotics, military, academia, and public research sector.

The Alumni Community

Upon finishing a course of study, graduates automatically become part of the University of London alumni community, a diverse global network of more than one million graduates in over 180 countries, providing lifelong links to the University and to each other.

Alumni are encouraged to keep in touch after they graduate and to become active members of the alumni community; in return they receive a number of benefits and services, including an extensive programme of events and engagement opportunities.

More information is available on the alumni [webpage](#).

Follow the alumni community on social media: [Facebook](#), [Instagram](#), [LinkedIn](#)